ABSTRACT

The alpha product of two fuzzy graphs G1:(σ_1,μ_1) and G2:(σ_2,μ_2) is defined as a fuzzy graph $G=G_1\times G_2=(\sigma_1\times \sigma_2,\mu_1\times \mu_2)$ on G*=(V,E) where $V=V_1\times V_2$ and $E=\{((u_1,u_2),(v_1,v_2))/u_1=v_1,u_2v_2\in E_2$ (or)$u_2=v_2,u_1v_1\in E_1$(or) $u_1\neq v_1,u_2v_2\in E_2$ (or)$u_2\neq v_2$ $u_1v_1\in E_1,\}$ with $\sigma_1\times \sigma_2(u_1,u_2)=\sigma_1(u_1)\wedge \sigma_2(u_2),\forall(u_1,u_2)\in V_1\times V_2(\mu_1\times \mu_2)((u_1,u_2),(v_1,v_2))=\{\sigma_1(u_1)\wedge \mu_2(u_2v_2)$,if $u_1=v_1,u_2v_2\in E_2$ $\sigma_2(u_2)\wedge \mu_1(u_1v_1)$,if $u_2=v_2,u_1v_1\in E_1\sigma_1(u_2)\wedge \sigma_1(u_2) \wedge \mu_1(u_1v_1)$,if $u_2\neq v_2,u_1v_1\in E_1$ $\sigma_1(u_1) \wedge \sigma_1(u_1)\wedge \mu_2(u_2v_2)$,if $u_1\neq v_1,u_2v_2\in E_2\}$.The beta product of two fuzzy graphs G_1:(σ_1,μ_1) and G_2:(σ_2,μ_2) is defined as a fuzzy graph$G=G_1\times G_2=(\sigma_1\times \sigma_2,\mu_1\times \mu_2)$ on G*=(V,E) where $V=V_1\times V_2$and$E=\{((u_1,u_2),(v_1,v_2))/u_1v_1\in E_1,u_2v_2\in E_2$ (or) $u_1\neq v_1,u_2v_2\in E_2$ (or)$u_2\neq v_2$ $u_1v_1\in E_1,\}$ with $\sigma_1\times \sigma_2(u_1,u_2)=\sigma_1(u_1)\wedge \sigma_2(u_2),\forall(u_1,u_2)\in V_1\times V_2(\mu_1\times \mu_2)((u_1,u_2),(v_1,v_2))=\{\mu_1(u_1,v_1)\wedge \mu_2(u_2,v_2),u_1v_1\in E_1,u_2v_2\in E_2\sigma_1(u_2)\wedge \sigma_1(u_2) \wedge \mu_1(u_1v_1)$,if $u_2\neq v_2,u_1v_1\in E_1\sigma_1(u_1) \wedge \sigma_1(u_1)\wedge \mu_2(u_2v_2)$,if $u_1\neq v_1,u_2v_2\in E_2\}$.The Gamma product of two fuzzy graphs G_1:(σ_1,μ_1) and G_2:(σ_2,μ_2) is defined as a fuzzy graph $G=G_1\times G_2=(\sigma_1\times \sigma_2,\mu_1\times \mu_2)$ on G*=(V,E) where $V=V_1\times V_2$ and $E=\{((u_1,u_2),(v_1,v_2))/u_1=v_1,u_2v_2\in E_2$ (or) $u_2=v_2,u_1v_1\in E_1$(or) $u_1\neq v_1,u_2v_2\in E_2$ (or) $u_2\neq v_2$ $u_1v_1\in E_1$ (or) $u_1v_1\in E_1,u_2v_2\in E_2\}$with $\sigma_1\times \sigma_2(u_1,u_2)=\sigma_1(u_1)\wedge \sigma_2(u_2),\forall(u_1,u_2)\in V_1\times V_2$ $(\mu_1\times \mu_2)((u_1,u_2),(v_1,v_2))=\{\sigma_1(u_1)\wedge \mu_2(u_2v_2)$,if $u_1=v_1,u_2v_2\in E_2$ $\sigma_2(u_2)\wedge \mu_1(u_1v_1)$,if $u_2=v_2,u_1v_1\in E_1$ $\sigma_1(u_2)\wedge \sigma_1(u_2) \wedge \mu_1(u_1v_1)$,if $u_2\neq v_2,u_1v_1\in E_1$ $\sigma_1(u_1) \wedge \sigma_1(u_1)\wedge \mu_2(u_2v_2)$,if $u_1\neq v_1,u_2v_2\in E_2$ $\mu_1(u_1,v_1)\wedge \mu_2(u_2,v_2)$, if $u_1v_1\in E_1,u_2v_2\in E_2\}$.An anti fuzzy graph is a pair of functions $\sigma: V \rightarrow [0,1]$ $and\ \mu: V \times V \rightarrow [0,1]$ $\mu(uv) \geq \sigma(u) \vee \sigma(v) \forall\ u, v \in V$.In this paper, we are going to apply the fuzzy operations on fuzzy graph and anti fuzzy graph.